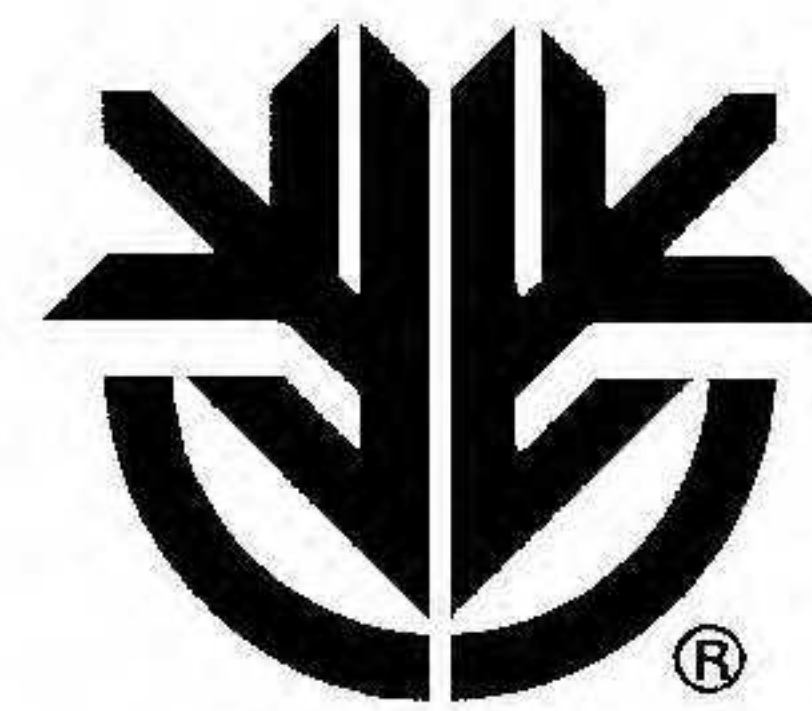

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New Species and Notes on *Begonia* (Begoniaceae)
from Middle America, I

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ABSTRACT. Four new species for the Begoniaceae, *Begonia campanensis* Burt-Utley & Utley and *B. fortunensis* Burt-Utley & Utley from Panama; *B. matudae* Burt-Utley & Utley from Chiapas, Mexico; and *B. makrinii* Burt-Utley & Utley from Oaxaca, Mexico, are described and illustrated. *Begonia mucronistipula* C. DC. from Panama is evaluated and synonymized with *B. davidsoniae* Standl. ex L. B. Sm. & B. G. Schub. and *B. brevicyma* C. DC.

RESUMEN. *Begonia campanensis* Burt-Utley & Utley y *B. fortunensis* Burt-Utley & Utley de Panamá, así como *B. matudae* Burt-Utley & Utley de Chiapas y *B. makrinii* Burt-Utley & Utley de Oaxaca, México se describen como nuevo. Se ilustran y evalúa *B. mucronistipula* C. DC. de Panamá, lo que resulta en la sinonimia de *B. davidsoniae* Standl. ex L. B. Sm. & B. G. Schub. y *B. brevicyma* C. DC. con ella.

Key words: *Begonia*, Begoniaceae, Chiapas, IUCN Red List, Mexico, Oaxaca, Panama.

The genus *Begonia* L. is represented in the Neotropics by 600 or more species that are distributed from northern Mexico in the states of Chihuahua, Sinaloa, Nuevo León, and Tamaulipas to southern South America. In Mexico and Central America, there are approximately 160 *Begonia* species, of which 106 occur in Mexico (81 endemic spp.), and, in contrast, only 80 species are reported from all of Central America (46 endemic spp.). Moreover, only a few widely distributed taxa (five spp.) range from Mexico into South America, but

several others (five spp.) are primarily South American species at the northernmost extensions of their ranges, occurring in Costa Rica and Panama (Burt-Utley, pers. obs.). Within Mexico and Central America, *Begonia* occupies a diversity of habitats from cloud forests and wet forests to seasonally dry forests and thorn-scrub vegetation at elevations from sea level to over 3300 m. Almost one third of the species in Mexico occur in seasonally dry environments, developing annually from underground tubers, and are most abundant in western Mexico. In *Flora Novo-Galiciana*, Volume 3, 19 of the 25 *Begonia* species treated are tuberous (Burt-Utley & McVaugh, 2001), representing over half of the tuberous species in Mexico (37 spp.) (Burt-Utley, pers. obs.). Unlike Mexico, only five tuberous species are reported from Central America and only two of these are endemic. In both Mexico and Central America, many *Begonia* species have limited distributions and occur in very local populations, potentially resulting from poor seed dispersal because the majority of species have capsules and seeds that lack apparent adaptations for dispersal (Burt-Utley, 1985). Based on morphological characters, there are two of at least 16 groups or sections that appear to be phenetically and geographically cohesive units, representing over half of the *Begonia* species in Mexico and Central America (92 spp.), section *Gireoudia* (Klotzsch) A. DC. (64 spp.) (Burt-Utley & Utley, 1990), and section *Weilbachia* (Klotzsch & Oerst.) A. DC. (25 spp.) (Burt-Utley & Utley, 1999). Within the area delimited by the *Flora Mesoamericana*, there are

currently 102 *Begonia* species known (Burt-Utley, pers. obs.), most of which occur in evergreen forests. The majority of these taxa are rhizomatous (58 spp.) and have staminate and pistillate flowers with two sepals, while lacking an inner perianth series of petals (55 spp.). Many of these species (44 spp.) have phenetic characters consistent with section *Gireoudia* (Burt-Utley, pers. obs.).

I. *Begonia* sect. *Gireoudia* (Klotzsch) A. DC., Ann Sci. Nat., Bot. sér. 4: 11. TYPE: *Begonia plebeja* Liebm. (lectotype, designated by Burt-Utley [1985: 33]).

The following four species are assigned to this section because of phenetic characters, including their asymmetric, palmately nerved leaf blades, staminate and pistillate flowers with a perianth comprised of two sepals, and trilocular ovaries with bipartite placentae (Burt-Utley, 1985): *Begonia campanensis*, *B. fortunensis*, *B. makrinii*, and *B. matudae*. Morphological information used for comparisons with two of the new species is taken from Burt-Utley (1985).

I. *Begonia campanensis* Burt-Utley & Utley, sp. nov. TYPE: Panama. Panamá: Cerro Campana, 2400–2600 ft., 21 Feb. 1987, J. Utley & K. Utley 7728 (holotype, USF; isotypes, CAS, DUKE, GH, MEXU, MO, NY, PMA, US). Figure 1.

Petioli trichomatibus 1–6 mm longis sparsim vel dense lanati. Stamina (57 ad)68 ad 95; antherae 0.6–1.1 mm longae; stigmata bicornuta. Capsulae 5.5–8.5 mm longae; alae inaequales, ala primaria anguste oblongo-elliptica 15–26 × 5.5–7.5(–8.5) mm.

Rhizomatous herbs 0.4–1 m tall in flower; rhizomes sprawling to erect, frequently rooting at the nodes; internodes most commonly elongate, (0.4–) 1.2–2.5(–3.7) cm, 5–13 mm diam., sparingly tomentose. Stipules deciduous, chartaceous, ovate, 15–26 × 12–18 mm, marginally entire, glabrous to minutely glandular or very rarely pilose, keeled, with the keel fimbriate-laciniate, cystospheres present; petioles (11.5–)18–36 cm, sparingly to densely tomentose-lanate with trichomes 1–6 mm; leaf blades oblique, asymmetrically broadly obovate to ovate, elliptic or suborbicular, (10.5–)12–20 × (7.6–)8.4–16.1 cm, basally deeply cordate, apically abruptly short acuminate, marginally eciliate, dentate and usually cuspidate with 1 to 2 cusps distally, above glabrous, below moderately to densely tomentose only on major nerves, cystospheres evident; (12 to)13 to 15(to 16)-palmatinerved. Inflorescences greatly exceeding the

foliage, symmetrically to asymmetrically cymose, branches of uppermost nodes reduced in length, ca. 40 flowers or more; peduncles 36.5–70 cm, sparingly pilose with age with trichomes to 2 mm; bracts usually deciduous, the lowermost convolute, navicular, symmetrically to asymmetrically broadly elliptic to ovate or obovate, 22–40 × 19–36 mm, apically apiculate to truncate, marginally entire, glabrous to sparingly glandular and pilose with trichomes to 2.5 mm. Staminate flowers with pedicels 8–14(–38) mm, glabrous to sparingly pilose, cystospheres present; sepals 2, broadly ovate to broadly transversely elliptic or suborbicular, 7–13 × 8–15 mm, glabrous to sparingly pilose, minutely glandular, cystospheres evident, white; petals 2, oblanceolate, 5–8(–11) × (2–)3.5–5(–6) mm, white to pale pink; stamens (57 to)68 to 95; filaments 0.4–1.2 mm on a very low torus; anthers elliptic to narrowly obovate, 0.6–1.1 mm. Pistillate flowers with pedicels (4–)6–13 mm; bracteoles wanting; sepals 2, broadly transversely elliptic to suborbicular, 6–12 × (6.5–)8–13 mm; petals 1 or occasionally wanting, oblanceolate, 5–8 × 2–4.5 mm, white to pale pink; ovaries trilocular with bipartite placentae, (2.5–)3.5–6 mm, glabrous throughout or sparingly pilose basally, cystospheres abundant; styles 3, 1–1.5 mm, connate to 1/2 their length; stigmas bicornute. Capsules with pedicels 8–17 mm; bodies 5.5–8.5 mm; locule chambers externally broadly obovate to elliptic or suborbicular, 4.5–7 × 4.5–6 mm; wings 3, unequal, the largest wing oblong-elliptic, 15–26 × 5.5–7.5(–8.5) mm, the second one asymmetrically triangular, 3.5–5 × 5–7 mm, the third marginiform.

Distribution and habitat. *Begonia campanensis* is known from the cloud forests of Cerro Campana and the vicinity of El Valle de Antón where it occurs at elevations between 730 and 1000 m. In the type locality, now a national park and protected area, it is locally abundant.

IUCN Red List category. *Begonia campanensis* is assessed here as Data Deficient (DD) according to IUCN Red List criteria (IUCN, 2001). This species does not appear to be widely distributed in Panama, but its occurrence in Parque Nacional Cerro Campana affords it an important level of protection that it would otherwise not have.

Etymology. The specific epithet *campanensis* refers to Cerro Campana where this species most commonly has been collected.

Discussion. *Begonia campanensis* is characterized by its sprawling to erect rhizomes, petioles

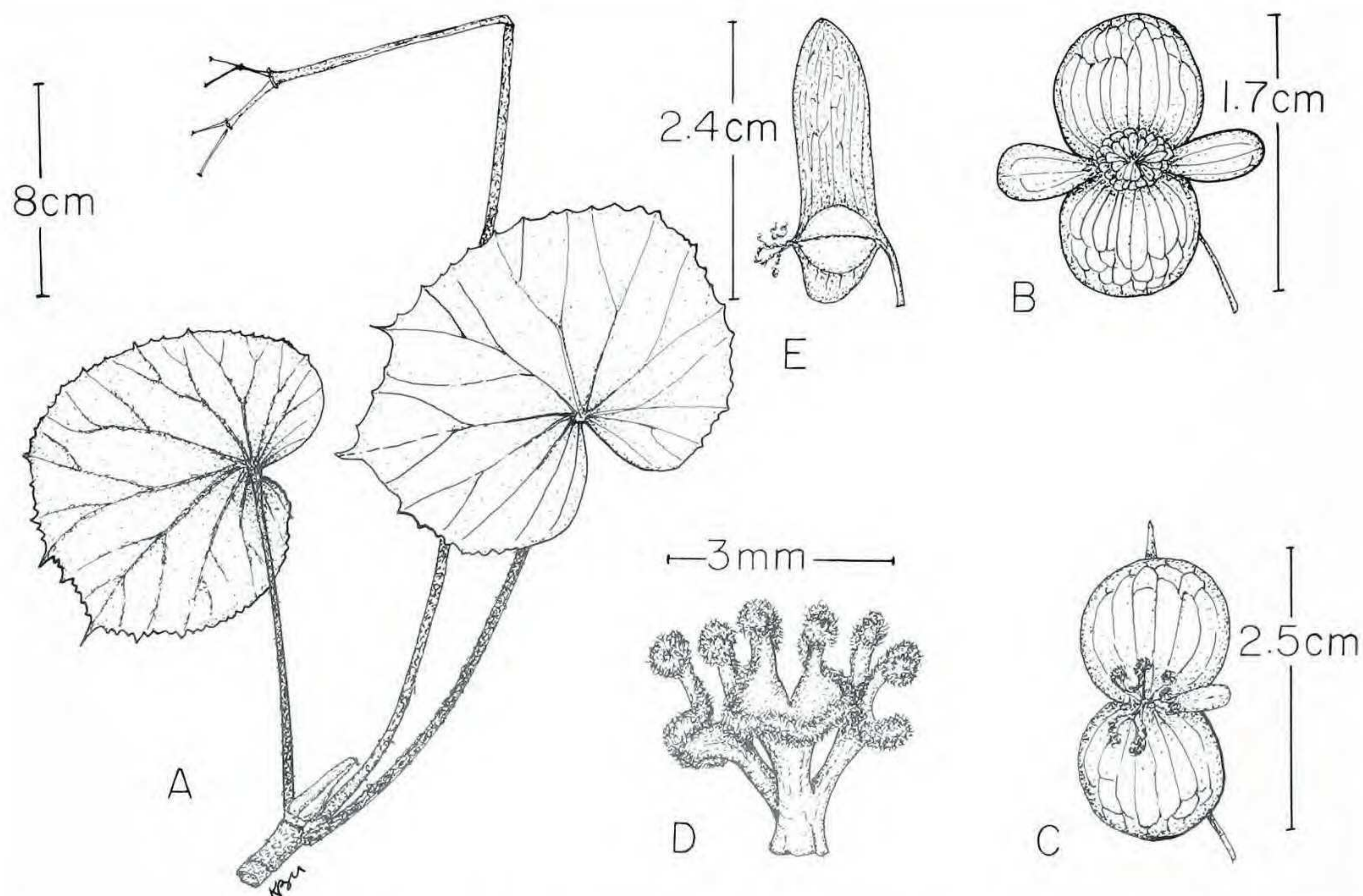


Figure 1. *Begonia campanensis* Burt-Utley & Utley. —A. Habit. —B. Staminate flower. —C. Pistillate flower. —D. Stigmas. —E. Capsule. Drawn from the holotype *J. Utley & K. Utley 7728* (USF).

sparingly to densely lanate, and its staminate and pistillate flowers with an inner perianth series. This species is tentatively placed in section *Gireoudia* because it appears most closely related to another Panamanian endemic, *B. garagarana* C. DC. in section *Gireoudia*, with which it shares its generally elongate rhizome internodes, a similar leaf form, large navicular bracts, flowers with an inner perianth series, numerous stamens, and similar capsules with elongate dorsal wings, but small asymmetrically triangular to marginiform lateral wings (Burt-Utley, 1985). *Begonia campanensis* can be distinguished readily from *B. garagarana* by numerous other vegetative and floral characters, including its tomentose to lanate petioles versus glabrate petioles, longer trichomes (1–6 mm vs. 0.1–1 mm), persistent stipules, larger bracts (22–40 × 19–36 mm vs. 14–19 × 10–16 mm), more numerous stamens ([57–]68 to 95 vs. 30 to 46), shorter anthers (0.6–1.1 mm vs. 2–2.8 mm), shorter capsular pedicels (8–17 mm vs. 17–30 mm), and more narrow primary wings (5.5–7.5[–8.5] mm vs. [7–]11–15 mm).

Paratypes. PANAMA. **Coclé:** hills N of El Valle de Antón, vic. of La Mesa, 21 Jan. 1941, *P. Allen 2341* (F); divide SW of La Mesa at end of logging rd., 80°5'W, 8°35'N, 26 Dec. 1982, *B. Stein & C. Hamilton 975* (MO, USF). **Panamá:** Cerro Campana, near tower, 30 Mar. 1977,

J. Folsom, W. D'Arcy & L. Skog 2292 (MO, USF); 11 Mar. 1973, *R. Liesner 598* (CAS, DUKE, F, MEXU, MO [2], NY, US, USF); 29 Mar. 1977, *D'Arcy 11139* (MO, USF); above Su Lin Motel, 25 Mar. 1969, *D. M. Porter et al. 4211* (F, MO [2], UC); *D. M. Porter et al. 4287* (MO); low cloud forest near summit, 31 Dec. 1957, *L. B. Smith & S. Smith 3382* (F, MO); Parque Nacional Cerro Campana, 2 km N of hwy. 707, 79°55'W, 8°42'N, 850 m, 1 Jan. 1983, *Stein & Hamilton 1129* (MO).

2. *Begonia fortunensis* Burt-Utley & Utley, sp. nov.
TYPE: Panama. Chiriquí: along trail ca. 1 mi. S of the Centro de Operaciones, toward refugio, upstream from suspension bridge over Río Hornito, 8°45'N, 82°14.5'W, 1100 m, 26 Feb. 1987, *J. Utley & K. Utley 7788* (holotype, USF; isotypes, C, CAS, DUKE, F, GH, MEXU, MICH, MO, NY, PMA, US). Figure 2.

Rhizomata repentia, internodiis elongatis villososquamosis vel squamosis. Stipulae persistentes cucullatae; petiolus indumento usque ad 3.5 mm longo dense squamosus vel villososquamosus; lamina foliaris lobata. Inflorescentiae 2- ad 4-dichotomae usque quadrichotomae. Stamina (6 ad)9 ad 14(ad 18); stigmata bicornuta.

Herbaceous perennials; rhizomes repent; internodes short to elongate, 0.6–4.5 cm, 0.3–0.7 cm diam., villous-squamoses to squamoses, with lacerate scales to 3 mm. Stipules persistent, distally cucullate,

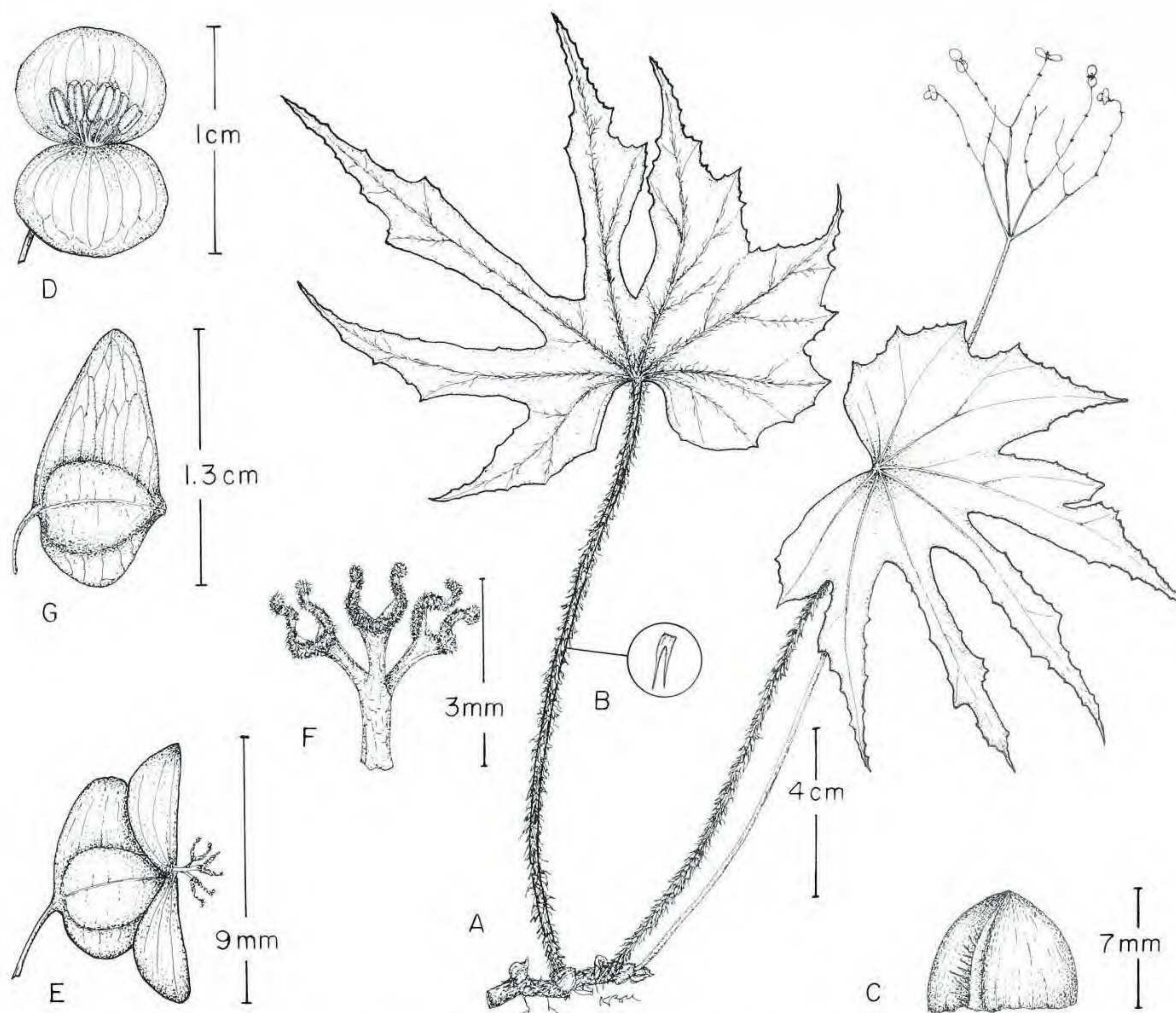


Figure 2. *Begonia fortunensis* Burt-Utley & Utley. —A. Habit. —B. Petiolar scale. —C. Stipule. —D. Staminate flower. —E. Pistillate flower. —F. Stigmas. —G. Capsule. Drawn from the holotype J. Utley & K. Utley 7788 (USF).

asymmetrically very broadly ovate to hemiorbicular, 5–11 × 6–9 mm, marginally entire, densely villous-squamose, keeled, with the keel only villous; petioles (8–)11–21(–32) cm, densely squamose or villous-squamose with villi and lacerate scales to 3.5 mm, cystospheres evident; leaf blades asymmetric, rarely symmetric, straight to oblique, transversely elliptic to obovate in outline, (5–)7–13.5 × (6.5–)10.5–20 cm, basally cordate, apically with no distinct apex, marginally deeply sinuately to palmately lobed with (3 or)4 to 8 lobes, usually 2 to 4 lobes incised 2/3 the length of the blade, eciliate and irregularly dentate to serrate, glabrous above, villous below only on major nerves; 9 to 11(to 12)-palmatinerved. Inflorescences generally exceeding the foliage, symmetric to weakly asymmetric, (2 to)3 to 4 radiate at the lowermost node, but only 2-branched at upper nodes, 40 flowers or more; peduncles 17.7–46 cm, glabrous or rarely very sparingly villous; bracts deciduous, at the lowermost node 2 to 4, very narrowly ovate to oblong or obovate, 1.5–4 mm × 1–2.5 mm, glabrous. Staminate flowers with pedicels 5.5–8.5(–10) mm, glabrous to minutely glandular; sepals 2, broadly obovate to transversely elliptic, 4–6.5 × 4.5–8 mm,

glabrous; petals wanting; stamens (6 to)9 to 14(to 18); filaments 0.3–1.1 mm, free or on a low torus; anthers narrowly elliptic to obovoid, 0.9–2 mm. Pistillate flowers with pedicels 4–9.5 mm; bracteoles wanting; sepals 2, broadly obovate to transversely elliptic, 4–7 × 4.5–7.5 mm, glabrous; petals wanting; ovary trilocular with bipartite placentae, 3.5–4.5(–5) mm, glabrous or rarely basally sparsely hirtellous; styles 3, 1.5–2 mm, connate to 1/2 their length; stigmas bicornute. Capsules with pedicels (8–)10–13 mm; bodies 6–7 mm; locule chambers externally appearing ovate to oblong, 5–5.5 × 4–5 mm; wings 3, unequal, the largest wing asymmetrically ovate to ovate-triangular, 7.5–9.5 × 6.5–7 mm, the second and third ones subequal to each other, elliptic to asymmetrically triangular, 3.5–4.5 × 5–5.5 mm.

Distribution and habitat. *Begonia fortunensis* is known only from Chiriquí Province in Panama, where it is locally common on wet, evergreen forested slopes above streams and rivers between 1400 and 1900 m.

IUCN Red List category. *Begonia fortunensis* is assessed here as Data Deficient (DD) according to

IUCN Red List criteria (IUCN, 2001). *Begonia fortunensis* appears to have a limited distribution in Panama and occurs in isolated, small populations. The species is afforded a level of protection because it is found in an area protected by the Fortuna Dam.

Etymology. The specific epithet *fortunensis* refers to the watershed of the Fortuna Dam site where the type was collected.

Discussion. Palmately lobed leaves, squamose to villous-squamose petioles, small capsules, and an unusual inflorescence form with more than two branches at lower inflorescence nodes distinguish *Begonia fortunensis* from other Mesoamerican *Begonia*. Only one other species in section *Gireoudia*, *B. quaternata* L. B. Sm. & B. G. Schub. from western Panama and eastern Costa Rica, has lower inflorescence nodes that regularly have more than two branches. Although these species share similar inflorescence branching patterns, squamose to villous-squamose induments, and cucullate to navicular stipules, they can be distinguished from each other readily by both vegetative and floral characters. In all specimens examined, leaf blades of *B. fortunensis* have conspicuous, deeply sinuate lobing, whereas those of *B. quaternata* are unlobed and only irregularly denticulate to dentate at ends of major nerves. Moreover, the generally smaller, persistent stipules observed on rhizomes of *B. fortunensis* differ from the larger, broader fugacious to caducous stipules of *B. quaternata* (5–11 × 6–9 vs. 9–13[–17] × 9–15 mm). Although both species have flowers with sepals of similar size, staminate flowers of *B. fortunensis* generally have fewer stamens than those of *B. quaternata* ([6–]9–18 vs. [11–]16–27[–30]), and their pistillate flowers have bicornute stigmas, which is in contrast to the broadly lunate stigmas of *B. quaternata* that occasionally have ends just beginning to spiral when dry (Burt-Utley, 1985).

Paratypes. PANAMA. **Chiriquí:** vic. of Los Planes de Hornito, along rd. to Fortuna Dam, N of Gualaca on Río Chiriquí, 2–3 km E of Finca Linares, 28 Nov. 1979, *T. Antonio 2866* (MO); E of Boquete on Cerro Azul near Quebrada Jaramillo, 11 Aug. 1974, *T. B. Croat 26787* (MO, USF); vic. of Planes de Hornito beyond Gualaca, ca. 23 km E of Finca Linares, 28 Nov. 1979, 1400–1900 m, *Croat 48844* (USF); vic. of Fortuna Dam, along trail below hwy. and across valley of Río Hornito, 8°45'N 82°15'W, 24 Jan. 1988, *G. McPherson 11984* (MO).

3. *Begonia makrinii* Morton ex Burt-Utley & Utley, sp. nov. TYPE: Mexico. Oaxaca: vic. of Cafetal Concordia, 400–650 m, 15 Apr. 1933, *C. V. Morton & E. Makrinus 2701* (holotype, US; isotype, F). Figure 3.

Rhizomata repentia, internodiis crassis 0.8–2.2 cm diam. Stipulae persistentes late ovatae 17–30 × (8–)21–24 mm; petiolus trichomatibus (3–)5–6 mm longis lanatus. Stamina 10 ad 13; stigmata lunata. Capsulae 6.5–9.5 mm longae; alae subaequales, ala primaria asymmetricè triangulari latiore quam longiore 5–7 × 6.5–8.5 mm.

Herbaceous perennials; rhizomes repent; internodes short and stout, 4–8 mm, (0.8–)1–2.2 cm diam., densely lanate in internodes with branching whiplash trichomes 4–9 mm and rings of narrow scales surrounding petiole scars. Stipules persistent, chartaceous, broadly ovate, 17–30 × (8–)21–24 mm, marginally entire, glabrous, strongly keeled, with the keel fimbriate-laciniate; petioles 4.8 cm or more, lanate with whiplash trichomes (3–)5–6 mm; leaf blades oblique, asymmetrically ovate to elliptic, 7.3–9 × 5–6.5 cm when not fully expanded, basally cordate, apically acuminate, marginally dentate to doubly dentate at ends of major nerves, ciliate and denticulate to irregularly dentate, pilose above with trichomes to 2 mm, pilose below with trichomes to 5 mm; 9-palmatinerved. Inflorescences shorter than to potentially exceeding the foliage, strongly asymmetric to unilateral, cymose, ca. 40 flowers or more; peduncles 7–19.4 cm, moderately to densely lanate with trichomes to 7 mm; bracts persistent, the lowermost broadly elliptic with one of the pairs appearing bilobed or trilobed distally, 5–7 × 3–6 mm, apically apiculate, marginally glandular-ciliate-denticulate distally, glandular within and without. Staminate flowers with pedicels 6.5–8.5 mm, minutely glandular; sepals very broadly transversely elliptic to suborbicular, 6–6.5 × 6–7.5 mm, glandular within and without, white; petals wanting; stamens 10 to 13; filaments 0.5–1 mm, borne on a low torus; anthers oblong to narrowly obovate, 1.3–1.5 mm. Pistillate flowers with pedicels 8–11 mm post-anthesis, bracteoles wanting; sepals 2, persistent on maturing capsules, broadly oblong-elliptic to broadly transversely elliptic, 5.5–9 × 5.5–8.5 mm, sparingly glandular within and without, white; petals wanting; ovary trilocular with bipartite placentae, 6–7.5 mm post-anthesis, minutely glandular; styles 3, 1.5–2 mm, fused to 1/2 their length; stigmas lunate. Capsules with pedicels (7.5–)9–12(–17) mm, conspicuously glandular; bodies 6.5–9.5 mm; locule chambers appearing elliptic, 6–7.5 × 4–4.5 mm; wings subequal, the largest one asymmetrically triangular, 5–7 × 6.5–8.5 mm, remaining wings lunate to triangular, 3.5–5 × 6.5–9 mm.

Distribution and habitat. *Begonia makrinii* is known only from the type locality in the Sierra Madre del Sur at elevations between 400 and 650 m in the vicinity of Cafetal Concordia on Cerro Concordia

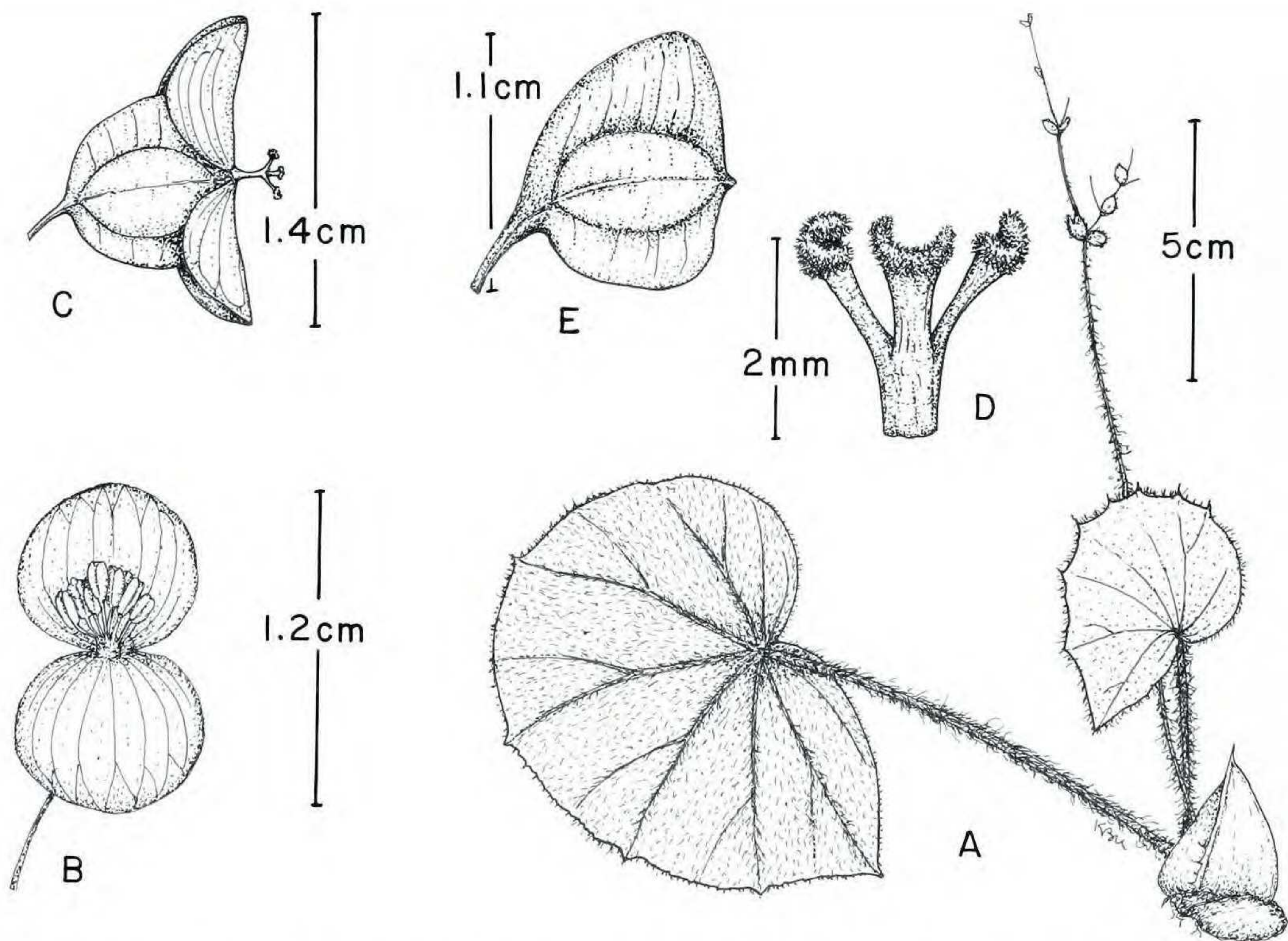


Figure 3. *Begonia makrinii* Morton ex Burt-Utley & Utley. —A. Habit. —B. Staminate flower. —C. Pistillate flower. —D. Lunate stigmas. —E. Capsule with remains of perianth removed. A–E illustrated from the holotype C. V. Morton & E. Makrinus 2701 (US).

(Cerro Espino). Although this area was visited by botanists in the early 20th century, few have collected there since Morton and Makrinus.

IUCN Red List category. *Begonia makrinii* is assessed here as Data Deficient (DD) according to IUCN Red List criteria (IUCN, 2001). The general region where the type of *B. makrinii* was collected is an important area for the cultivation of coffee in southern Oaxaca. Until other collections of this rare species are found, it is impossible to make any meaningful judgments about risks to the survival of this species.

Etymology. *Begonia makrinii* is named in honor of Emil Makrinus, who collected this species while assisting C. V. Morton in his fieldwork in Mexico when he was ill.

Discussion. *Begonia makrinii* is characterized by a suite of characters, including rhizomes with short, stout internodes, petioles with whiplash trichomes, strongly asymmetric cymose inflorescences, persistent bracts, staminate flowers with few stamens, and

capsules with persistent sepals and subequal wings. The whiplash trichomes observed on *B. makrinii* are known from other species in section *Gireoudia* (Burt-Utley, 1985), including *B. hydrocotylifolia* Otto ex Hook. (Fellerer, 1892) and *B. chiapensis* Burt-Utley (Burt-Utley, 1986) but have not been observed in other phenetic groups from Mexico or Central America. Leaf blades on the holotype are not fully expanded and it is likely that specimens with larger leaves and longer petioles than those observed will be encountered. This is supported by C. V. Morton's notation on the holotype that "the leaves get very much larger (fide Makrinus)." *Begonia makrinii* is most similar to *B. hydrocotylifolia* Hook., a Mexican endemic from the barrancas in central Veracruz, in a group of characters including its rhizomatous habit, whiplash trichomes, ciliate bracts, lunate stigmas, and immature capsules with persistent perianths and subequal wings. These species may be separated from each other by their distribution in Mexico, and a number of vegetative and reproductive characters, including *B. makrinii*'s larger stipules (17–30 mm vs. 6–11 mm), longer leaf blades (7.3–9+ cm vs. 3.6–6.2

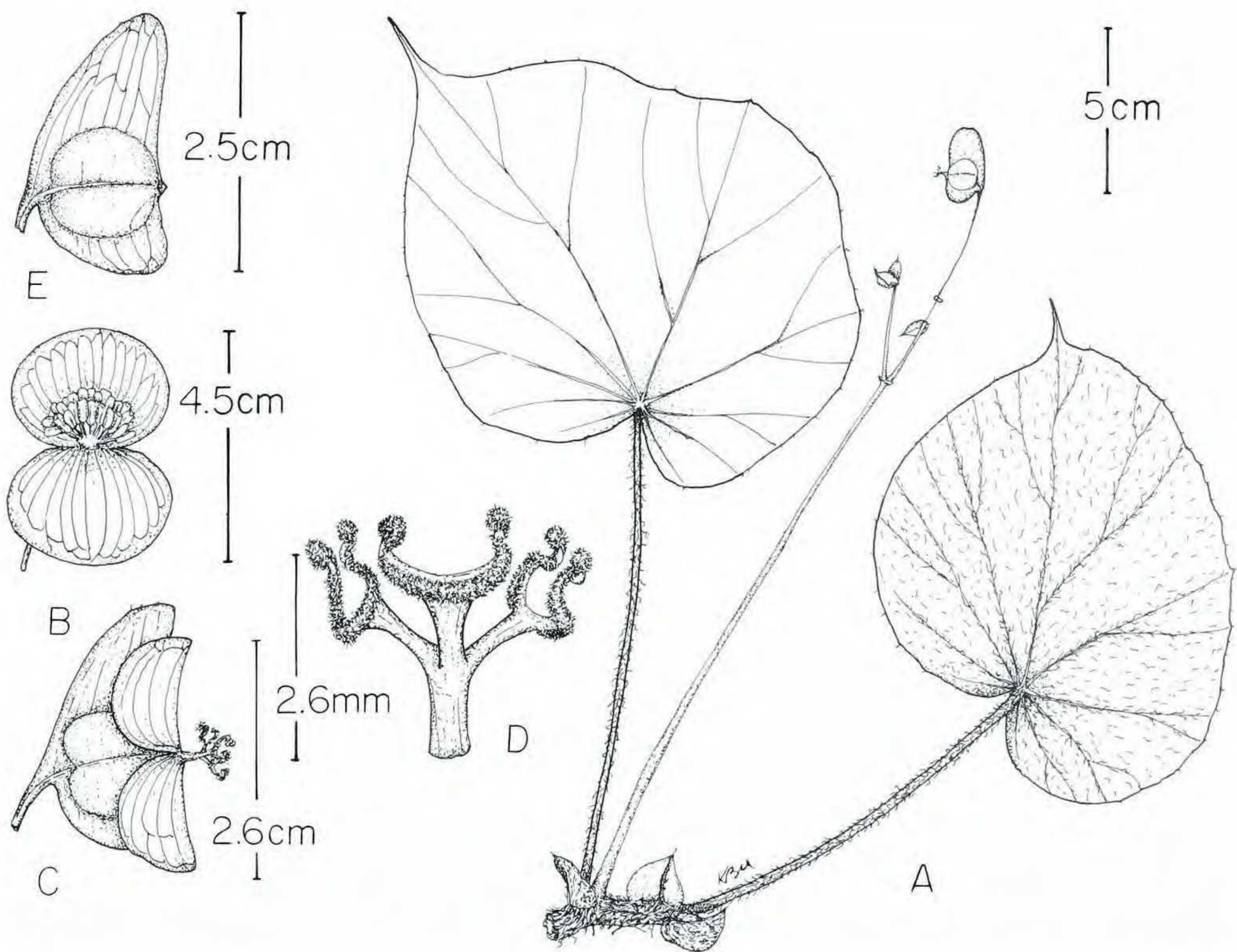


Figure 4. *Begonia matudae* Burt-Utley & Utley. —A. Habit. —B. Staminate flower. —C. Pistillate flower. —D. Stigmas. —E. Capsule. A and B drawn from *E. Matuda 38397* (MEXU); C–E from the holotype *D. E. Breedlove & R. Thorne 30107* (DS).

cm), and smaller capsules (6.5–9.5 mm vs. [8.5–]10–13 mm) (Burt-Utley, pers. obs.).

4. *Begonia matudae* Burt-Utley & Utley, sp. nov.

TYPE: Mexico. Chiapas: SE side of Cerro Tres Picos & ridges near summit, 2100–2500 m, 11 Dec. 1972, *D. E. Breedlove & R. Thorne 30107* (holotype, DS). Figure 4.

Rhizomata repentia, internodiis 1–1.5 cm longis dense squamosis. Stipulae persistentes; petiolus trichomatibus 7 mm longis dense pilosus. Stamina 30 vel 31; stigmata bicornuta. Capsulae 9–13.5 mm longae; alae inaequales.

Herbaceous perennials; rhizomes repent; internodes 1–1.5 cm, 5–8 mm diam., densely squamose with lacerate scales to 8 mm. Stipules persistent, cartilaginous, asymmetrically broadly ovate, 13–20 × 13–17 mm, marginally entire, villous throughout, strongly keeled, with the keel fimbriate; petioles 11–20 cm, densely pilose with villi and occasional narrow scales to 7 mm; leaf blades oblique, asymmetrically ovate to elliptic, 14.5–20 × 10–14.5 cm, basally cordate, apically attenuate-acuminate, marginally dentate to undulate at ends of major

nerves, ciliate and denticulate to irregularly dentate, glabrous to very sparingly pilose only near the blade petiole junction, pilose throughout below with trichomes 4–5 mm; 10-palmatinerved. Inflorescences shorter than to barely exceeding the foliage, moderately asymmetrically cymose, ± 10 to 20 flowers; peduncles 11.5–26 cm, sparingly villous; bracts deciduous to persistent, the lowermost broadly ovate, 4.5–7 × 4–6 mm, marginally entire, glabrous to sparingly villous distally. Staminate flowers with the pedicels unknown, sepals 2, transversely elliptic, 15–18 × 20–23 mm, glabrous; petals wanting; stamens 30 or 31; filaments 1.5–2 mm, borne on a low torus; anthers oblong to narrowly obovate, 1.8–2.5 mm. Pistillate flowers with pedicels 16–22 mm, bracteoles wanting; sepals 2, transversely elliptic, 11–13 × 15–19 mm, glabrous, pink; petals wanting; ovary 9–11 mm, trilocular to quadrilocular with bipartite placentae, glabrous, pink; styles 3, occasionally one bearing an additional stigmatic surface, 2 mm, connate to 1/2 their length; stigmas bicornute. Capsules with pedicels (18–)21–30 mm; bodies 9–13.5 mm; locule chambers externally appearing transversely broadly elliptic or suborbicular, 7–11.5

× 8–11 mm; wings 3 or 4, unequal, the largest wing straight to subfalcate and oblong to ovate, (11–)14–18 × (7–)10–14.5 mm, marginally entire to denticulate and sparingly ciliate distally, if a fourth wing present, then that wing subequal to the first, remaining wings marginiform.

Distribution and habitat. *Begonia matudae* is known only from elevations between 2100 and 2500 m in montane rainforests, evergreen cloud forests, and elfin forests with *Drimys* J. R. Forst. & G. Forst., *Quercus* L., *Ostrya* Scop., *Liquidambar* L., *Styrax* L., and *Ilex* L. in the Sierra Madre de Chiapas in southern Chiapas.

IUCN Red List category. *Begonia matudae* is assessed here as Data Deficient (DD). This species has only been collected twice from an area of Chiapas that has not been well collected. More collections are necessary to adequately evaluate the species and determine its IUCN category.

Etymology. It is a pleasure to name this species in honor of the late Dr. Eizi Matuda (1894–1978) who made many significant and interesting *Begonia* collections in Chiapas and elsewhere in Mexico.

Discussion. *Begonia matudae* is an attractive species with elongate internodes, densely pilose petioles with villi and occasional narrow scales, large flowers, bicornute stigmas, and large capsules. In its indument, general leaf form, and stigmatic structure, *B. matudae* appears most similar to *B. chiapensis* (Burt-Utley, 1986). The longer petiolar hairs (7 mm vs. 2 mm), larger stipules (1.3–2 cm vs. 0.5–1.5 cm), larger sepals (♂: 15–18 × 20–23 mm vs. 5.5–8 × 7–11 mm), larger anthers (1.8–2.5 mm vs. 1–1.3 mm), and capsules (9–13.5 mm vs. 8–9 mm) of *B. matudae* effectively separate these species. Capsules on the paratype *E. Matuda* 38397 are unusual in being occasionally quadrilocular and having four wings. Although these specimens had ovaries with three styles, one of the styles bore two stigmas. In other characters the Matuda collection was indistinguishable from the holotype. Although species in section *Gireoudia* characteristically have trilocular ovaries, capsules with an additional locule and wing are encountered (Burt-Utley, pers. obs.) and could represent occasional developmental aberrations. More collections of *B. matudae* are needed to evaluate the significance of variation in capsular characters observed.

Paratypes. MEXICO. **Chiapas:** Ojo de Agua, Paxital, 8 Jan. 1972, *E. Matuda* 38397 (MEXU).

TAXONOMIC NOTES

Begonia mucronistipula C. DC., Smithsonian. Misc. Collect. 69: 3. 1919. TYPE: Panama. Chiriquí: betw. Río Ladrillo & Los Sigüas Camp, S slope of Cerro de la Horqueta, 1200–1700 m, 17–19 Mar. 1911, *H. Pittier* 3172 (holotype, US; isotype, US).

Begonia brevicyma C. DC., Smithsonian Misc. Collect. 69: 3. 1919. TYPE: Panama. Chiriquí: humid forest around Los Sigüas Camp, S slope of Cerro de la Horqueta, 1700 m, 17–19 Mar. 1911, *W. R. Maxon* 5417 (holotype, US).

Begonia davidsoniae Standl. ex L. B. Sm. & B. G. Schub., J. Wash. Acad. Sci. 40: 242. 1950, as “*davidsonae*.” TYPE: Panama. Chiriquí: Bajo Chorro, Boquete Distr., 6000 ft., 5 Jan. 1938, *M. E. Davidson* 38 (holotype, MO; isotypes, F, US).

Begonia mucronistipula and *B. brevicyma* were both discovered on the southern slope of Cerro Horqueta near the Los Sigüas Camp during a collecting trip March 17–19, 1911. In Casimir de Candolle’s description of *B. mucronistipula* (1919), staminate flowers were characterized as having free stamens, while those of *B. brevicyma* had stamens inserted on a raised torus. With respect to stamen insertion, both taxa have stamens inserted on a raised torus and cannot be distinguished from each other by using this character. Moreover, pistillate flowers of *B. mucronistipula* were described as 3-lobed, but were unknown for *B. brevicyma*. However, Lyman Smith noted on the holotype of this latter taxon that pistillate flowers had an inner perianth series of two “tepals” or petals. *Begonia davidsoniae* was described and distinguished from both *B. mucronistipula* and *B. brevicyma* by its two inner petals (instead of none or one) and its bracteoles (Smith & Schubert, 1950). Material from the holotype of this taxon (*M. E. Davidson* 38, MO) had an immature pistillate flower with two sepals and two petals, as well as a single rudimentary bracteole subtending only one of the immature pistillate flowers observed. Both *B. mucronistipula* and *B. davidsoniae* were distinguished from *B. brevicyma* by staminate petal (tepal) shape when compared with sepal shape by Smith and Schubert (1958) in the *Flora of Panama* and by Smith and Wasshausen (1986) in a key to the Begoniaceae. In *B. brevicyma*, they were characterized as being subsimilar, while those of both *B. mucronistipula* and *B. davidsoniae* were considered to be dissimilar to the sepals. Using this criterion, it is impossible to distinguish these taxa from one another in the key because the inner perianth series or petals are essentially the same size and shape in all three taxa. With respect to petal number on pistillate flowers, the type collection of *B. davidsoniae* (*M. E. Davidson* 38, F, MO, US) revealed pistillate flowers

with one or two petals, like those of either *B. mucronistipula* or *B. brevicyma*. Although both *B. brevicyma* and *B. davidsoniae* were tentatively placed in *Weilbachia*, a section characterized by bilocular ovaries, and *B. mucronistipula* was included in section *Gireoudia* (Doorenbos et al., 1998), all three taxa have similar trilocular ovaries. Moreover, vegetatively, these taxa cannot be distinguished from one another and also have characteristic cystoliths that are abundant in ovary and capsule walls, as well as in their bracts and sepals. Considering that it is impossible to distinguish these taxa from one another, both *B. brevicyma* and *B. davidsoniae* herein are considered synonymous with *B. mucronistipula*.

Additional specimens examined. PANAMA. **Chiriquí:** Bajo Chorro-Boquete Distr., *D'Arcy 10106* (MO, USF), *Woodson & Schery 620* (MO); 3.5 mi. NE of Boquete, end of rd. along Río Palo Alto, 17 Nov. 1978, *Hammel 5682* (MO, USF); NW of Boquete, Cerro Horqueta, *Dwyer et al.* (MO); W-facing slopes, open S flank of Cerro Horqueta, *Cochrane et al. 6272* (MO, WIS); SW slopes of Cerro Horqueta ca. 6 km NW of Boquete, *Wilbur et al. 15458* (DUKE); slopes approaching Cerro Horqueta starting ca. 6.6 km N-NE of Cerro Boquete, *Wilbur & Luteyn 19247* (DUKE); end of rd. to Bajo Mono, *Folsom et al. 2256* (MO).

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